median total interval and median treatment interval as cutoff points to divide patients. Univariable and multivariable Cox proportional hazard model was used to evaluate overallsurvival (OS).

Table 1. Patients characteristics and treatment modalities

Patient parameter		
Sex		
Female	37 (20%)	
Male	148 (80%)	
Age		
= 65 y	134 (73%)	
> 65 y	51 (27%)	
ACE-27 comorbidity grade		
0-1	133 (72%)	
2-3	52 (28%)	
Tobacco		
Yes	143 (77%)	
No	42 (23%)	
T stage		
T1-2	62 (34%)	
T3-4	123 (66%)	
N stage		
N0-1	56 (30%)	
N2-3	129 (70%)	
TNM stage		
III	48 (26%)	
IV	137 (74%)	
HPV status		
Positive	39 (21%)	1
Negative	41 (22%)	
Unknown	105 (57%)	
Treatment parameter		
PET for staging		
Yes	100 (54%)	
No	85 (46%)	
IMRT		
Yes	210 (79%)	
No	55 (21%)	

Results: At a median follow up of 37 months, the 3-year OS for the entire cohort was 63%. Median total interval and treatment interval were of 98 days and 29 days, respectively. Patients with longer total interval were more likely to be patients with a low comorbidity grade (ACE-27 grade 0-1). On multivariable analysis a longer total interval was associated with a reduced risk of dying (hazard ratio 0.37, 95% CI 0.13 – 1,01; p = 0.05). No association of longer treatment interval with OS was noted on univariable and multivariable analysis. Longer treatment interval resulted associated with the use of PET for staging (p = 0.13), and with the use of CCRT for treatment (p = 0.05). In the subgroup analysis by treatment modality, no difference in OS according to treatment interval was noted.

Conclusion: In HNSCC patients with stage III-IV at diagnosis, a reduction of total interval and of treatment delay does not ameliorate survival. Development of fast track referral strategies should be aimed at increasing the ratio of stage I-II patients.

EP-1089

Accelerated hypofractionated IMRT-IGRT and concurrent chemotherapy in oropharyngeal cancer

B. Meduri[1], E. D'Angelo[1], P. Barbieri[1], L. Rubino[1], A. Ghidini[1], F. Bertolini[1], R. Depenni[1], P. Giacobazzi[1], F. Bertoni[1]
[1]*University Hospital of Modena, Radiation Oncology, Modena, Italy*

Purpose or Objective: In head and neck cancer absolute improvements in locoregional control rate and overall survival rate are achieved when radiotherapy is accelerated. Concurrent chemotherapy also have been used to improve outcomes at the cost of increased toxicity. The use of IMRT for head and neck cancer has been associated with reduced acute toxicity. Clinical experience with accelerated IMRT-SIB with concurrent chemotherapy for advanced oropharyngeal squamous cell carcinoma (LAOC), however, is limited. Objective of our study is to evaluate efficacy and toxicity of an accelerated hypofractionated SIB-IMRT with Tomotherapy and concurrent chemotherapy in LAOC.

Material and Methods: Between July 2009 and February 2014, 59 consecutive patients with LAOC received accelerated hypofractionated radiotherapy with tomotherapy and concurrent chemotherapy. The disease was stage III in 8% and stage IVa in 92% of patients. Prescribed doses to primary tumor and involved nodes was 66 Gy at 2,2 Gy/fraction, high risk and low risk nodes received simultaneously 60 Gy and 54 Gy at 2,0 Gy and 1,8 Gy/fraction, over 6 weeks. Acute toxicity was scored according to RTOG and late toxicity according to CTCAE-4 criteria. The disease free survival (DFS), local disease free survival (local-DFS), metastasis free survival (MFS) and overall survival were calculated using the Kaplan-Meier method.

Results: With median follow-up of 38 months (range 14-70) the estimated 3-years local-DFS rate, MFS, DFS and OS were 88%±0.04SE, 91%±0.04SE, 82%±0.05SE, and 83%±0.04SE, respectively. The complete response rate was 88%. All the patients completed the radiotherapy; the median treatment duration was 43 days, six patients have temporarily discontinued treatment (median: 5 days) because of toxicity. No grade 4 acute toxicitiy was observed, maximal acute toxicities were G3: mucosa 31%, skin 15%, dysphagia 24%, leukopenia 5%. Maximal late toxicities were: xerostomia G2 36%, mucosa G2 23%, skin G2 12%, laryngeal G2 17%, dysphagia G2 14%, osteoradionecrosis 3%, trismus 9%.

Conclusion: This analysis shows that a moderatly accelerated hypofractionated IMRT-SIB in tomotherapy and concurrent chemotherapy achieved high tumor local control and acceptable toxicity compared with previous chemoradiotherapy treatment with standard fractionation. Based on these results we elaborate a randomized clinical trial with a more hypofractionated regimen in order to obtain a better local control without increasing toxicity.

EP-1090

Overall treatment time is not a prognostic factor in chemoradiation for nasopharyngeal carcinoma.

E. Netto[1], M. Ferreira[2], I. Sargento[2], J. Cabeçadas[3], A. Mota[4], F. Pires[4], T. Alexandre[2], P. Montalvão[2], M. Magalhães[4], M. Roldão[4]
[1]*Nova Medical School, Medicine - Radiation Oncology, Lisboa, Portugal*
[2]*Instituto Português de Oncologia de Lisboa Francisco Gentil-EPE, Medical Oncology, Lisboa, Portugal*
[3]*Instituto Português de Oncologia de Lisboa Francisco Gentil-EPE, Pathology, Lisboa, Portugal*
[4]*Instituto Português de Oncologia de Lisboa Francisco Gentil-EPE, Radiation Oncology, Lisboa, Portugal*

Purpose or Objective: Overall treatment time (OTT) is an important factor in head and neck radiotherapy of squamous-cell carcinoma, the authors investigate its role in a nasopharyngeal carcinoma (NPC) population.

Material and Methods: We reviewed 109 patients charts with NPC. Pathological, clinical and dosimetric data were retrieved. All patients received concomitant chemo-radiation (CCRT) with IMRT-SIB with 69.96Gy to GTVs, 59.4 and 54Gy to CTVs in 33 fractions (RTOG0615). Cisplatin-based chemotherapy (CT) was prescribed as per Intergoup 0099. OTT was recorded from the first day of radiation through the last day of CCRT regardless adjuvant CT. Per protocol treatment was defined as OTT < 7 weeks. Any interruption was recorded as well its length and cause. Kaplan-Meier curves were created by SPSS (IBM Statistics), log-rank test was applied to detect differences and Cox regression model was adjusted to compare variables.

Results: From 109 patients, median age was 53; 74% male; 71% were WHO grade III; 43% T1; 14% T2; 18% T3, 25% T4; 17% N0; 17% N1; 39% N2; 27% N3. With a median follow up of 22 months, 2-year local control was 95,9%, freedom from metastases was 88% and overall survival was 79,8%. 9

patients were excluded because didn't receive CT (T1N0). From the remaining 100, 95 received concomitant plus adjuvant CT and 5 concurrent CT. We found a median OTT of 49 days (range: 11-83 days). 39 patients completed CCRT in more than 7 weeks (50-83 days) from which 31 (79%) in 8 weeks and the remaining 8 (21%) in more than 8 weeks. Interruption causes were by medical indication in 6 (15%), and non-clinical reasons in 33 (85% - patient no show, machine breakdown, and mis-coordination between departments). Compensations were performed at the discretion of the treating physician in the 8 patients with OTT longer than 8 weeks. No difference in local control (LC, p= 0.766), overall survival (OS, p=0.855) or metastases free survival (p= 0.131). Cox regression confirmed age, N stage, local control and distant metastases status as prognostic factors however no impact was found for OTT (p = 0.890 for < 7 weeks; p = 0.959 for < 8 weeks; and p = 0.960 for > 8 weeks).

Cox Regression – Overall Treatment Time vs. Survival
Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
Age	,079	,024	10,454	1	,001	1,082
NStage			10,159	3	,017	
NStage(1)	-2,102	1,004	4,387	1	,036	,122
NStage(2)	-1,661	,742	5,007	1	,025	,190
NStage(3)	-1,851	,722	6,571	1	,010	,157
LCSTATUS	-2,219	,998	4,943	1	,026	,109
MetsStatus	-1,670	,653	6,543	1	,011	,188
OTTime (<7 weeks)			,232	2	,890	
OTTime (7-8 weeks)	8,344	161,761	,003	1	,959	4206,337
OTTime (>8 weeks)	8,055	161,762	,002	1	,960	3149,082

Conclusion: In our study, we found no differences in LC and OS regardless OTT. These data must be interpreted with caution due to the high number of patients receiving CT that may compensate the unplanned interruptions in such a sensitive entity. Further studies with longer follow up are necessary to recommend or not withholding compensations in this setting.

EP-1091

Stratifying patients of head and neck cancer into risk groups for local control: predictive models

B. Dua[1], K. Chufal[2], G. Jadhav[1], A. Thakwani[2], A. Bhatnagar[2]
[1]*Apollo Hospital, Radiotherapy, Delhi, India*
[2]*Batra Hospital, Radiotherapy, Delhi, India*

Purpose or Objective: There have been numerous studies that have shown the importance of tumor volume as an independent prognostic factor over and above the T stage in head and neck cancer. However, data from the Indian subcontinent is sparse, even more so in patients treated by IMRT. This merits further study owing to possible differences in the biology of Indian head and neck cancer compared to its western counterpart. Ours was a prospective study that attempted to elucidate the role of tumor volume as a prognostic factor in locally advanced oropharyngeal and hypopharyngeal cancer.

Material and Methods: We enrolled 87 patients of Stage III-IV squamous cell cancer of the hypopharynx(30), and oropharynx(57), who subsequently received definitive concurrent chemo radiation with IG-IMRT. The tumor volume was the gross tumor volume (TV) delineated on the planning CT scan and was calculated by the volume algorithm in the treatment planning system. The impact of TV on Locoregional relapse free survival (LRFS), Response to chemo radiation (RR), overall survival (OS),local control(LC) and regional control was assessed over a follow up of 2 years. The Shapiro wilk test was done for assessing normality. Survival analysis was by kaplan meir method with log rank testing for assessing significance between groups Univariate analysis was done by mann-whitney/chi square/fisher's exact test , multiariate analysis was done by logistic regression forward stepwise method and a model to predict LC was generated .An ROC curve analysis was done for estimation of cut offs.

Results: The 2 year OS, LRFS, RR, LC& RC were 64%, 56%, 65%,63% and 83% respectively .The T stage distribution was T2, T3&T4 (5/41/41).The TV was not normally distributed and the mean TV was 48 cc (5-167cc) with mean TV in T3 /T4 patients of 39.9/60.9 cc. The mean TV in locally controlled patients was 35.4cc vs 70.8cc in uncontrolled patients .While the TV was a significant prognostic predictor for the OS , LRFS ,RR, and LC on univariate analysis , on the multivariate analysis only the TV predicted for LC. ROC curve analysis found cut off of 38 cc with 2 year LC of 84 % / 40% for TV<38cc / >38cc respectively with log rank p=0.001 with AUC of 0.759(0.653-0.865) and sensitivity/specificity of 82%/64%. ROC curve analysis of our oropharyngeal subgroup revealed similar results with a cut off of 38cc with AUC of 0.770 (0.644-0.896) and sensitivity / specificity of 80%/66%.with 2 year LC of 79%/30% for TV<38cc / >38cc (p=0.001). The likelihood of local failure increased by 3 % for 1cc increase in TV for the entire cohort & 3% for our oropharyngeal subgroup.

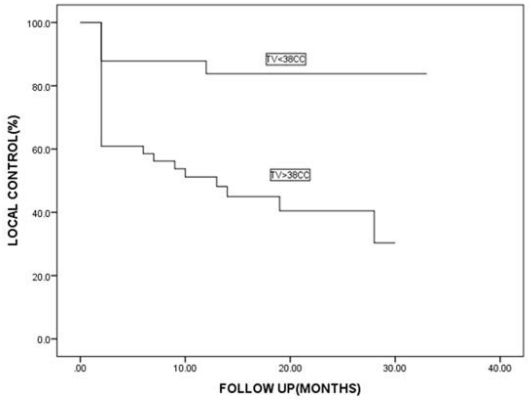

Figure: Kaplan Meir curve for patients with TV < 38 cc and >38cc

MULTIVARIATE LOGISTIC REGRESSION MODEL FOR LC

ODDS OF LOCAL FAILURE (P): LOG (P) =2.036 + 0.030 X TV (ALL PATIENTS)

ODDS OF LOCAL FAILURE (P): LOG (P) =1.857 + 0.032 X TV (OROPHARYNX PATIENTS)

Conclusion: TV is an independent prognostic factor in patients with head and neck cancer in predicting local control. Implications for existing management paradigms include, stratification according to TV in future randomized trials, consideration of altered fractionation and/or dose escalation to the primary disease for patients with TV>38cc.

EP-1092

Intensive radiotherapy in locally advanced head and neck squamous cell cancer- is it worth the pain?

A. Pascoe[1], C. Weston[2], J. Christian[1], M. Griffin[1], J. Price[3]
[1]*Nottingham University Hospitals NHS Trust, Department of Oncology, Nottingham, United Kingdom*
[2]*University of Nottingham, School of Medicine, Nottingham, United Kingdom*
[3]*Derby Teaching Hospitals NHS Foundation Trust, Department of Oncology, Derby, United Kingdom*

Purpose or Objective: With increasing evidence for combined modality treatment in locally advanced squamous cell cancer of the head and neck (HNSCC), there remains debate about the best treatment approach for patients with T4 disease. Local control in HNSCC is extremely important due to the morbidity and mortality associated with local recurrence. However treatment itself can be associated with significant morbidity. The purpose of this review is to determine both overall survival (OS) and local control rates for patients with T4 tumours treated with Intensity Modulated Radiotherapy (IMRT) with or without prior surgery.